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<110> NORPHARMA SPA

<120> Recombinant bacterial strains for the production of
      natural nucleosides and modified analogues thereof

<130> 99DC26E

<140> PCT/EP99/10416
<141> 1999-12-23

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<170> PatentIn Ver. 2.1

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12

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13

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14

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15

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16

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17

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<210> 9
<211> 6269
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: udp and deoD
      cloned in pUC18 so to create a fusion between the
      two proteins

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19

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<210> 10
<211> 6299
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: udp and deoD
      cloned in pUC18 so to create a fusion between the
      two proteins bonded to each other via an aa linker

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20

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21

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22

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accgctcgcc gcagccgaac gaccgagcgc agcgagtcag tgagcgagga agcggaaga 6299


<210> 11
<211> 2297
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: cloning vector
      derived from pUC18

<400> 11
gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagaattcg 60
agctcggtac ccggggatcc tctagagtcg acctgcaggc atgcaagctt atggtgcact 120
ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc gccaacaccc 180
gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca agctgtgacc 240
gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg cgcgagacga 300
aagggcctcg tgatacgcct attttttatag gttaatgtca tgataataat ggtttcttag 360
acgtcaggtg cacttttcg gggaaatgtg cgcggaaccc ctatttgttt attttttctaa 420
atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct tcaataatat 480
tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc cttttttgcg 540
gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa agatgctgaa 600
gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg taagatcctt 660
gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt tctgctatgt 720
ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg catacactat 780
tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac ggatggcatg 840
acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc ggccaactta 900
cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa catgggggat 960
catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc aaacgacgag 1020
cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt aactggcgaa 1080
ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga taaagttgca 1140
ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa atctggagcc 1200
ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa gccctcccgt 1260
atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa tagacagatc 1320
gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt ttactcatat 1380
atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt gaagatcctt 1440
tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg agcgtcagac 1500
cccgtagaaa agatcaaagg atcttcttga tcctttttt ttctgcgcgt aatctgctgc 1560
ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca agagctacca 1620
actctttttc cgaaggtaac tggcttcagc agagcgcaga taccaaatac tgtccttcta 1680
```

23

```
gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac atacctcgct 1740
ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct taccgggttg 1800
gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg gggttcgtgc 1860
acacagccca gcttggagcg aacgacctac accgaactga gatacctaca gcgtgagcta 1920
tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt aagcggcagg 1980
gtcggaacag gagagcgcac gagggagctt ccaggggggaa acgcctggta tctttatagt 2040
cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc gtcaggggggg 2100
cggagcctat ggaaaaacgc cagcaacgcg gcctttttac ggttcctggc cttttgctgg 2160
ccttttgctc acatgttctt tcctgcgtta tcccctgatt ctgtggataa ccgtattacc 2220
gcctttgagt gagctgatac cgctcgccgc agccgaacga ccgagcgcag cgagtcagtg 2280
agcgaggaag cggaaga                                               2297


<210> 12
<211> 3031
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: udp and deoD
      cloned into pGM746 without upstream  ptac promoter

<400> 12
gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagaattcg 60
agctcggtac ccggggatcc tagcaggagg gaattcttcc atggctaccc cacacattaa 120
tgcagaaatg ggcgatttcg ctgacgtagt tttgatgcca ggcgacccgc tgcgtgcgaa 180
gtatattgct gaaactttcc ttgaagatgc ccgtgaagtg aacaacgttc gcggtatgct 240
gggcttcacc ggtacttaca aaggccgcaa aatttccgta atgggtcacg gtatgggtat 300
cccgtcctgc tccatctaca ccaaagaact gatcaccgat ttcggcgtga agaaaattat 360
ccgcgtgggt tcctgtggcg cagttctgcc gcacgtaaaa ctgcgcgacg tcgttatcgg 420
tatgggtgcc tgcaccgatt ccaaagttaa ccgcatccgt tttaaagacc atgactttgc 480
cgctatcgct gacttcgaca tggtgcgtaa cgcagtagat gcagctaaag cactgggtat 540
tgatgctcgc gtgggtaacc tgttctccgc tgacctgttc tactctccgg acggcgaaat 600
gttcgacgtg atggaaaaat acggcattct cggcgtggaa atggaagcgg ctggtatcta 660
cggcgtcgct gcagaatttg gcgcgaaagc cctgaccatc tgcaccgtat ctgaccacat 720
ccgcactcac gagcagacca ctgccgctga gcgtcagact accttcaacg acatgatcaa 780
aatcgcactg gaatccgttc tgctgggcga taaagagtaa gtcgacctgc aggcatgcaa 840
gcttatggtg cactctcagt acaatctgct ctgatgccgc atagttaagc cagccccgac 900
acccgccaac acccgctgac gcgccctgac gggcttgtct gctcccggca tccgcttaca 960
gacaagctgt gaccgtctcc gggagctgca tgtgtcagag gttttcaccg tcatcaccga 1020
aacgcgcgag acgaaagggc ctcgtgatac gcctattttt ataggttaat gtcatgataa 1080
taatggtttc ttagacgtca ggtggcactt ttcggggaaa tgtgcgcgga acccctattt 1140
gtttattttt ctaaatacat tcaaatatgt atccgctcat gagacaataa ccctgataaa 1200
tgcttcaata atattgaaaa aggaagagta tgagtattca acatttccgt gtcgccctta 1260
ttcccttttt tgcggcattt tgccttcctg ttttttgctca cccagaaacg ctggtgaaag 1320
taaaagatgc tgaagatcag ttgggtgcac gagtgggtta catcgaactg gatctcaaca 1380
gcggtaagat ccttgagagt tttcgccccg aagaacgttt tccaatgatg agcactttta 1440
aagttctgct atgtggcgcg gtattatccc gtattgacgc cgggcaagag caactcggtc 1500
```

24

```
gccgcataca ctattctcag aatgacttgg ttgagtactc accagtcaca gaaaagcatc 1560
ttacggatgg catgacagta agagaattat gcagtgctgc cataaccatg agtgataaca 1620
ctgcggccaa cttacttctg acaacgatcg gaggaccgaa ggagctaacc gctttttgc 1680
acaacatggg ggatcatgta actcgccttg atcgttggga accggagctg aatgaagcca 1740
taccaaacga cgagcgtgac accacgatgc ctgtagcaat ggcaacaacg ttgcgcaaac 1800
tattaactgg cgaactactt actctagctt cccggcaaca attaatagac tggatggagg 1860
cggataaagt tgcaggacca cttctcgcgct cggcccttcc ggctggctgg tttattgctg 1920
ataaatctgg agccggtgag cgtgggtctc gcggtatcat tgcagcactg gggccagatg 1980
gtaagccctc ccgtatcgta gttatctaca cgacggggag tcaggcaact atggatgaac 2040
gaaatagaca gatcgctgag ataggtgcct cactgattaa gcattggtaa ctgtcagacc 2100
aagtttactc atatatactt tagattgatt taaaacttca ttttttaattt aaaaggatct 2160
aggtgaagat ccttttttgat aatctcatga ccaaaatccc ttaacgtgag ttttcgttcc 2220
actgagcgtc agaccccgta gaaaagatca aaggatcttc ttgagatcct tttttttctgc 2280
gcgtaatctg ctgcttgcaa acaaaaaaac caccgctacc agcggtggtt tgtttgccgg 2340
atcaagagct accaactctt tttccgaagg taactggctt cagcagagcg cagataccaa 2400
atactgtcct tctagtgtag ccgtagttag gccaccactt caagaactct gtagcaccgc 2460
ctacatacct cgctctgcta atcctgttac cagtggctgc tgccagtggc gataagtcgt 2520
gtcttaccgg gttggactca agacgatagt taccggataa ggcgcagcgg tcgggctgaa 2580
cggggggttc gtgcacacag cccagcttgg agcgaacgac ctacaccgaa ctgagatacc 2640
tacagcgtga gctatgagaa agcgccacgc ttcccgaagg gagaaaggcg gacaggtatc 2700
cggtaagcgg cagggtcgga acaggagagc gcacgaggga gcttccaggg ggaaacgcct 2760
ggtatcttta tagtcctgtc gggtttcgcc acctctgact tgagcgtcga tttttgtgat 2820
gctcgtcagg ggggcggagc ctatggaaaa acgccagcaa cgcggccttt ttacggttcc 2880
tggccttttg ctggcctttt gctcacatgt tctttcctgc gttatcccct gattctgtgg 2940
ataaccgtat taccgccttt gagtgagctg ataccgctcg ccgcagccga acgaccgagc 3000
gcagcgagtc agtgagcgag gaagcggaag a                                3031
```

<210> 13
<211> 3128
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: deoD cloned
      downstream ptac promoter

<400> 13
```
gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagaattcg 60
agctccgaca tcataacggt tctggcaaat attctgaaat gagctgttga caattaatca 120
tcggctcgta taatgtgtgg aattgtgagc ggataacaat ttcacacagg aggatcctag 180
caggagggaa ttcttccatg gctaccccac acattaatgc agaaatgggc gatttcgctg 240
acgtagtttt gatgccaggc gacccgctgc gtgcgaagta tattgctgaa actttccttg 300
aagatgcccg tgaagtgaac aacgttcgcg gtatgctggg cttcaccggt acttacaaag 360
gccgcaaaat ttccgtaatg ggtcacggta tgggtatccc gtcctgctcc atctacacca 420
aagaactgat caccgatttc ggcgtgaaga aaattatccg cgtgggttcc tgtggcgcag 480
ttctgccgca cgtaaaactg cgcgacgtcg ttatcggtat gggtgcctgc accgattcca 540
aagttaaccg catccgtttt aaagaccatg actttgccgc tatcgctgac ttcgacatgg 600
```

25

```
tgcgtaacgc agtagatgca gctaaagcac tgggtattga tgctcgcgtg ggtaacctgt 660
tctccgctga cctgttctac tctccggacg gcgaaatgtt cgacgtgatg gaaaaatacg 720
gcattctcgg cgtggaaatg gaagcggctg gtatctacgg cgtcgctgca gaatttggcg 780
cgaaagccct gaccatctgc accgtatctg accacatccg cactcacgag cagaccactg 840
ccgctgagcg tcagactacc ttcaacgaca tgatcaaaat cgcactggaa tccgttctgc 900
tgggcgataa agagtaagtc gacctgcagg catgcaagct tatggtgcac tctcagtaca 960
atctgctctg atgccgcata gttaagccag ccccgacacc cgccaacacc cgctgacgcg 1020
ccctgacggg cttgtctgct cccggcatcc gcttacagac aagctgtgac cgtctccggg 1080
agctgcatgt gtcagaggtt ttcaccgtca tcaccgaaac gcgcgagacg aaagggcctc 1140
gtgatacgcc tatttttata ggttaatgtc atgataataa tggtttctta cgtcaggt 1200
ggcacttttc ggggaaatgt gcgcggaacc cctatttgtt tattttccta aatacattca 1260
aatatgtatc cgctcatgag acaataaccc tgataaatgc ttcaataata ttgaaaaagg 1320
aagagtatga gtattcaaca tttccgtgtc gcccttattc ccttttttgc ggcattttgc 1380
cttcctgttt ttgctcaccc agaaacgctg gtgaaagtaa aagatgctga agatcagttg 1440
ggtgcacgag tgggttacat cgaactggat ctcaacagcg gtaagatcct tgagagtttt 1500
cgccccgaag aacgttttcc aatgatgagc acttttaaag ttctgctatg tggcgcggta 1560
ttatcccgta ttgacgccgg gcaagagcaa ctcggtcgcc gcatacacta ttctcagaat 1620
gacttggttg agtactcacc agtcacagaa aagcatctta cggatggcat gacagtaaga 1680
gaattatgca gtgctgccat aaccatgagt gataacactg cggccaactt acttctgaca 1740
acgatcggag gaccgaagga gctaaccgct tttttgcaca acatggggga tcatgtaact 1800
cgccttgatc gttgggaacc ggagctgaat gaagccatac caaacgacga gcgtgacacc 1860
acgatgcctg tagcaatggc aacaacgttg cgcaaactat taactggcga actacttact 1920
ctagcttccc ggcaacaatt aatagactgg atggaggcgg ataaagttgc aggaccactt 1980
ctgcgctcgg cccttccggc tggctggttt attgctgata atctggagc cggtgagcgt 2040
gggtctcgcg gtatcattgc agcactgggg ccagatggta agccctcccg tatcgtagtt 2100
atctacacga cggggagtca ggcaactatg gatgaacgaa atagacagat cgctgagata 2160
ggtgcctcac tgattaagca ttggtaactg tcagaccaag tttactcata tatactttag 2220
attgatttaa aacttcattt ttaatttaaa aggatctagg tgaagatcct ttttgataat 2280
ctcatgacca aaatccctta acgtgagttt tcgttccact gagcgtcaga ccccgtagaa 2340
aagatcaaag gatcttcttg agatcctttt tttctgcgcg taatctgctg cttgcaaaca 2400
aaaaaaccac cgctaccagc ggtggtttgt ttgccggatc aagagctacc aactctttt 2460
ccgaaggtaa ctggcttcag cagagcgcag ataccaaata ctgtccttct agtgtagccg 2520
tagttaggcc accacttcaa gaactctgta gcaccgccta catacctcgc tctgctaatc 2580
ctgttaccag tggctgctgc cagtggcgat aagtcgtgtc ttaccgggtt ggactcaaga 2640
cgatagttac cggataaggc gcagcggtcg ggctgaacgg ggggttcgtg cacacagccc 2700
agcttggagc gaacgaccta caccgaactg agatacctac agcgtgagct atgagaaagc 2760
gccacgcttc ccgaagggag aaaggcggac aggtatccgg taagcggcag ggtcggaaca 2820
ggagagcgca cgagggagct tccaggggga aacgcctggt atctttatag tcctgtcggg 2880
tttcgccacc tctgacttga gcgtcgattt ttgtgatgct cgtcagggg gcggagccta 2940
tggaaaaacg ccagcaacgc ggcctttta cggttcctgg ccttttgctg gccttttgct 3000
cacatgttct tcctgcgtt atcccctgat tctgtggata accgtattac cgcctttgag 3060
tgagctgata ccgctcgccg cagccgaacg accgagcgca gcgagtcagt gagcgaggaa 3120
gcggaaga                                                        3128
```

<210> 14
<211> 3934
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: udp and deoD
      cloned downstream ptac promoter

<400> 14
gcgcccaata cgcaaaccgc ctctccccgc gcgttggccg attcattaat gcagaattcg 60
agctccgaca tcataacggt tctggcaaat attctgaaat gagctgttga caattaatca 120
tcggctcgta taatgtgtgg aattgtgagc ggataacaat ttcacacagg aggatcctag 180
caggagggaa ttcttccatg gctaccccac acattaatgc agaaatgggc gatttcgctg 240
acgtagtttt gatgccaggc gacccgctgc gtgcgaagta tattgctgaa actttccttg 300
aagatgcccg tgaagtgaac aacgttcgcg gtatgctggg cttcaccggt acttacaaag 360
gccgcaaaat ttccgtaatg ggtcacggta tgggtatccc gtcctgctcc atctacacca 420
aagaactgat caccgatttc ggcgtgaaga aaattatccg cgtgggttcc tgtggcgcag 480
ttctgccgca cgtaaaactg cgcgacgtcg ttatcggtat gggtgcctgc accgattcca 540
aagttaaccg catccgtttt aaagaccatg actttgccgc tatcgctgac ttcgacatgg 600
tgcgtaacgc agtagatgca gctaaagcac tgggtattga tgctcgcgtg ggtaacctgt 660
tctccgctga cctgttctac tctccggacg gcgaaatgtt cgacgtgatg gaaaaatacg 720
gcattctcgg cgtggaaatg gaagcggctg gtatctacgg cgtcgctgca gaatttggcg 780
cgaaagccct gaccatctgc accgtatctg accacatccg cactcacgag cagaccactg 840
ccgctgagcg tcagactacc ttcaacgaca tgatcaaaat cgcactggaa tccgttctgc 900
tgggcgataa agagtaagtc gacacaggaa acagctatga ccatgattac gaattcgagc 960
tcggtaccat ccatgtccaa gtctgatgtt tttcatctcg gcctcactaa aaacgattta 1020
caaggggcta cgcttgccat cgtccctggc gacccggatc gtgtggaaaa gatcgccgcg 1080
ctgatggata agccggttaa gctggcatct caccgcgaat tcactacctg gcgtgcagag 1140
ctggatggta aacctgttat cgtctgctct accggtatcg gcggcccgtc tacctctatt 1200
gctgttgaag agctggcaca gctgggcatt cgcaccttcc tgcgtatcgg tacaacgggc 1260
gctattcagc cgcatattaa tgtgggtgat gtcctggtta ccacggcgtc tgtccgtctg 1320
gatggcgcga gcctgcactt cgcaccgctg gaattcccgg ctgtcgctga tttcgaatgt 1380
acgactgcgc tggttgaagc tgcgaaatcc attggcgcga caactcacgt tggcgtgaca 1440
gcttcttctg ataccttcta cccaggtcag gaacgttacg atacttactc tggtcgcgta 1500
gttcgtcact ttaaaggttc tatggaagag tggcaggcga tgggcgtaat gaactatgaa 1560
atggaatctg caaccctgct gaccatgtgt gcaagtcagg cctgcgtgc cggtatggta 1620
gcgggtgtta tcgttaaccg cacccagcaa gagatcccga atgctgagac gatgaaacaa 1680
accgaaagcc atgcggtgaa aatcgtggtg gaagcggcgc gtcgtctgct gtaattctct 1740
taagcttatg gtgcactctc agtacaatct gctctgatgc cgcatagtta agccagcccc 1800
gacacccgcc aacacccgct gacgcgccct gacgggcttg tctgctcccg gcatccgctt 1860
acagacaagc tgtgaccgtc tccgggagct gcatgtgtca gaggttttca ccgtcatcac 1920
cgaaacgcgc gagacgaaag ggcctcgtga tacgcctatt tttataggtt aatgtcatga 1980
taataatggt ttcttagacg tcaggtggca cttttcgggg aaatgtgcgc ggaacccta 2040
tttgtttatt tttctaaata cattcaaata tgtatccgct catgagacaa taaccctgat 2100
aaatgcttca ataatattga aaaaggaaga gtatgagtat tcaacatttc cgtgtcgccc 2160
ttattccctt ttttgcggca ttttgccttc ctgttttgc tcacccagaa acgctggtga 2220
aagtaaaaga tgctgaagat cagttgggtg cacgagtggg ttacatcgaa ctggatctca 2280
acagcggtaa gatccttgag agttttcgcc ccgaagaacg ttttccaatg atgagcactt 2340
ttaaagttct gctatgtggc gcggtattat cccgtattga cgccgggcaa gagcaactcg 2400
gtcgccgcat acactattct cagaatgact tggttgagta ctcaccagtc acagaaaagc 2460

27

```
atcttacgga tggcatgaca gtaagagaat tatgcagtgc tgccataacc atgagtgata 2520
acactgcggc caacttactt ctgacaacga tcggaggacc gaaggagcta accgcttttt 2580
tgcacaacat gggggatcat gtaactcgcc ttgatcgttg ggaaccggag ctgaatgaag 2640
ccataccaaa cgacgagcgt gacaccacga tgcctgtagc aatggcaaca acgttgcgca 2700
aactattaac tggcgaacta cttactctag cttcccggca acaattaata gactggatgg 2760
aggcggataa agttgcagga ccacttctgc gctcggccct ccggctggc tggtttattg 2820
ctgataaatc tggagccggt gagcgtgggt ctcgcggtat cattgcagca ctggggccag 2880
atggtaagcc ctcccgtatc gtagttatct acacgacggg gagtcaggca actatggatg 2940
aacgaaatag acagatcgct gagataggtg cctcactgat taagcattgg taactgtcag 3000
accaagtttta ctcatatata ctttagattg atttaaaact tcattttttaa tttaaaagga 3060
tctaggtgaa gatccttttt gataatctca tgaccaaaat cccttaacgt gagttttcgt 3120
tccactgagc gtcagacccc gtagaaaaga tcaaaggatc ttcttgagat ccttttttttc 3180
tgcgcgtaat ctgctgcttg caaacaaaaa aaccaccgct accagcggtg gtttgtttgc 3240
cggatcaaga gctaccaact cttttttccga aggtaactgg cttcagcaga gcgcagatac 3300
caaatactgt ccttctagtg tagccgtagt taggccacca cttcaagaac tctgtagcac 3360
cgcctacata cctcgctctg ctaatcctgt taccagtggc tgctgccagt ggcgataagt 3420
cgtgtcttac cgggttggac tcaagacgat agttaccgga taaggcgcag cggtcgggct 3480
gaacgggggg ttcgtgcaca gcccagct tggagcgaac gacctacacc gaactgagat 3540
acctacagcg tgagctatga gaaagcgcca cgcttcccga agggagaaag gcggacaggt 3600
atccggtaag cggcagggtc ggaacaggag agcgcacgag ggagcttcca gggggaaacg 3660
cctggtatct ttatagtcct gtcgggtttc gccacctctg acttgagcgt cgattttttgt 3720
gatgctcgtc aggggggcgg agcctatgga aaaacgccag caacgcggcc ttttttacggt 3780
tcctggcctt ttgctggcct tttgctcaca tgttctttcc tgcgttatcc cctgattctg 3840
tggataaccg tattaccgcc tttgagtgag ctgataccgc tcgccgcagc cgaacgaccg 3900
agcgcagcga gtcagtgagc gaggaagcgg aaga                            3934
```

<210> 15
<211> 6046
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: udp and deoD
      cloned downstream ptac promoter

<400> 15
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gcgcccaata cgcaaaccgc ctctcccgc gcgttggccg attcattaat gcagaattcg 60
agctccgaca tcataacggt tctggcaaat attctgaaat gagctgttga caattaatca 120
tcggctcgta taatgtgtgg aattgtgagc ggataacaat ttcacacagg aggatcctag 180
caggagggaa ttcttccatg gctaccccac acattaatgc agaaatgggc gatttcgctg 240
acgtagtttt gatgccaggc gacccgctgc gtgcgaagta tattgctgaa actttccttg 300
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